

MPS-A09 (SILICON)

NPN SILICON ANNULAR TRANSISTOR

... designed for preamplifier applications in audio amplifiers.

- Collector-Emitter Breakdown Voltage —
BVCEO = 50 Vdc (Min) @ IC = 1.0 mAdc
- Low Noise Figure —
NF = 1.4 dB (Typ) @ IC = 100 μ Adc

MAXIMUM RATINGS

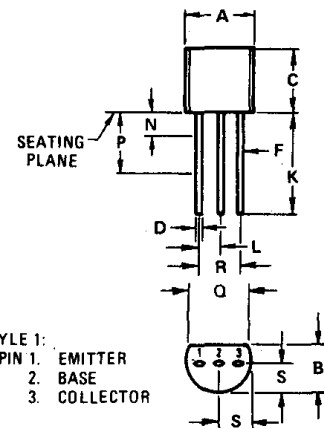
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	VCEO	50	Vdc
Collector-Base Voltage	VCB	50	Vdc
Emitter-Base Voltage	VEB	3.0	Vdc
Collector Current — Continuous	IC	50	mAdc
Total Power Dissipation @ TA = 25°C Derate above 25°C	PD	350 2.8	mW mW/°C
Total Power Dissipation @ TC = 25°C Derate above 25°C	PD	1.0 8.0	Watt mW/°C
Operating and Storage Junction Temperature Range	TJ, Tstg	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	R θ JA (1)	357	°C/W
Thermal Resistance, Junction to Case	R θ JC	125	°C/W

(1) R θ JA is measured with the device soldered into a typical printed circuit board.

NPN SILICON AMPLIFIER TRANSISTOR



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.450	5.200	0.175	0.205
B	3.180	4.190	0.125	0.165
C	4.320	5.330	0.170	0.210
D	0.407	0.533	0.016	0.021
F	0.407	0.482	0.016	0.019
K	12.700	—	0.500	—
L	1.150	1.390	0.045	0.055
N	—	1.270	—	0.050
P	6.350	—	0.250	—
Q	3.430	—	0.135	—
R	2.410	2.670	0.095	0.105
S	2.030	2.670	0.080	0.105

CASE 29-02
TO-92

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 1.0\text{ mAdc}$, $I_B = 0$)	BV_{CEO}	50	-	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.1\text{ mAdc}$, $I_E = 0$)	BV_{CBO}	50	-	-	Vdc
Collector Cutoff Current ($V_{CB} = 25\text{ Vdc}$, $I_E = 0$)	I_{CBO}	-	-	100	nAdc
Emitter Cutoff Current ($V_{BE} = 3.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	-	-	100	nAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 0.1\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	100	-	600	-
Collector-Emitter Saturation Voltage ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$)	$V_{CE(sat)}$	-	-	0.9	Vdc
Base-Emitter On Voltage ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	$V_{BE(on)}$	-	-	1.0	Vdc

DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = 0.5\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 20\text{ MHz}$)	f_T	30	80	-	MHz
Output Capacitance ($V_{CB} = 5.0\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{ob}	-	-	5.0	pF
Noise Figure ($I_C = 0.1\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 6.8\text{ k ohms}$, $f = 1.0\text{ kHz}$)	NF	-	1.4	-	dB

(1) Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

FIGURE 1 – DC CURRENT GAIN

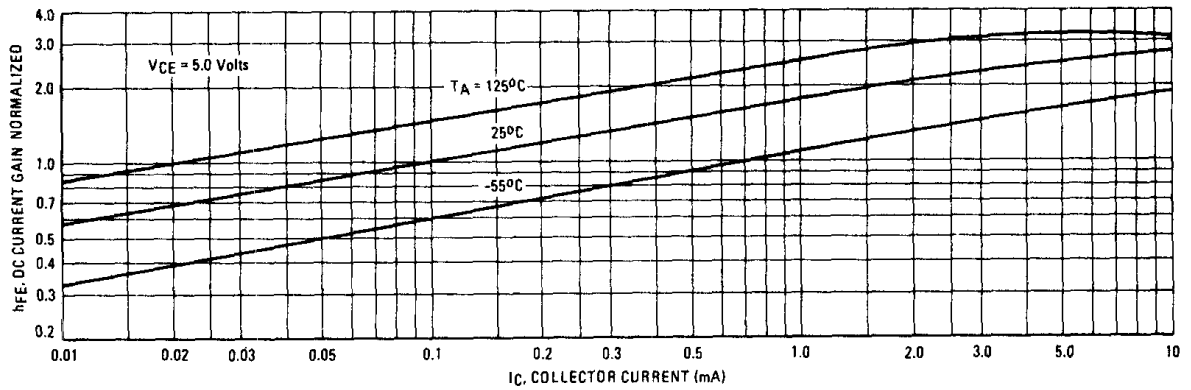


FIGURE 2 – COLLECTOR SATURATION REGION

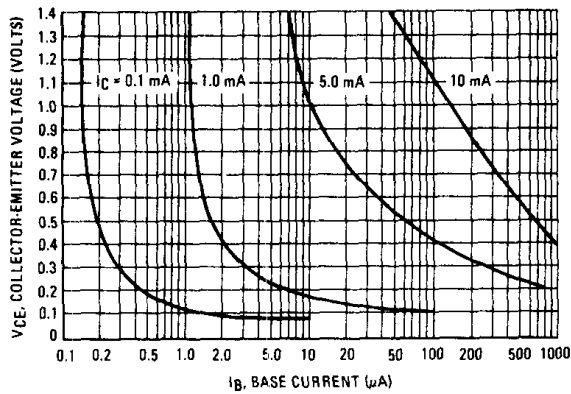
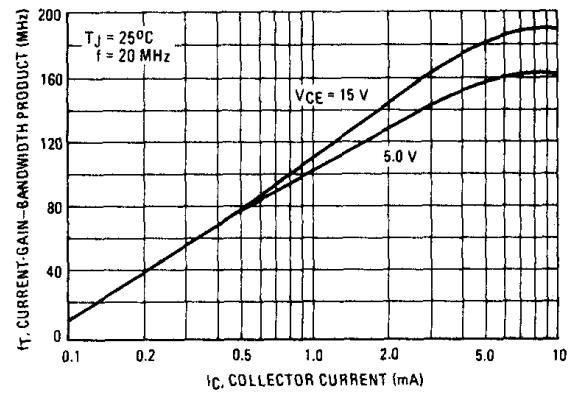


FIGURE 3 – CURRENT GAIN-BANDWIDTH PRODUCT



NOISE FIGURE

($V_{CE} = 5.0$ Vdc, $T_A = 25^\circ\text{C}$)

FIGURE 4 – FREQUENCY EFFECTS

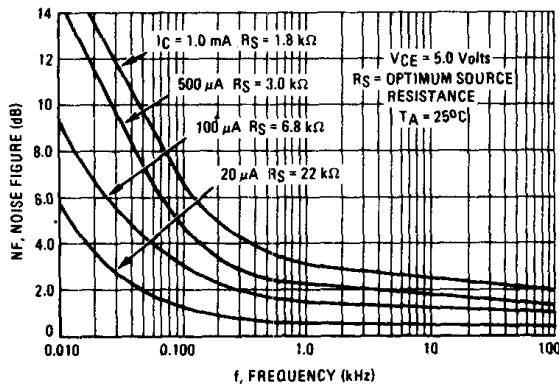


FIGURE 5 - SOURCE RESISTANCE EFFECT

